REMARKS

Claims 2, 4- 6, 8 and 10-12 are present for examination.

Amendments:

All claims are amended.

Each independent claim is amended to remove or qualify the phrase "multi-code CDMA" by replacing it with or adding a more explanatory phrase such as "making communication with one or more of said base stations over a plurality of CDMA channels at the same time, each CDMA channel characterized by use of a different CDMA diffusion code" (claim 2), which more explicitly describes the features of multi-code CDMA that are relevant to the claims.

The remaining amendments are intended to clarify the language of the claims without significantly altering their scope.

Because of the many changes made to the claims, a clean set of claims is attached at the end of this reply in case that would be of assistance to the Examiner in his review of the claims in their amended form.

No new matter is added.

Prior Art Rejection:

All claims are rejected under 35 U.S.C. § 103 (a) as obvious over Benveniste (U.S. 5,513,379) in view of Gitlin (U.S. 5,442,625). The Examiner is requested to reconsider the rejections with the following points in mind.

Overview of CDMA and multi-code CDMA

CDMA (code division multiple access) is scheme that allows multiple mobile units to communicate at the same time over the same carrier frequency. Essentially, the data stream produced by a mobile unit is modulated by a "diffusion" code (such as a pseudorandom sequence of bits) before it is transmitted, and the base station applies the same code again on the received signal to retrieve the data stream. Each mobile unit uses a different diffusion code, and the codes are chosen to have very low correlation between them. Consequently, several mobile units, using different diffusion codes, can transmit on the same carrier at the

same time. The base station receives the carrier, which contains the sum of all signals of all mobiles on that carrier, and can extract the data stream of any particular mobile by applying that mobile's diffusion code to the carrier. Because each diffusion code allows a unique signal to be sent, each diffusion code is thought of as providing a separate channel of the system.

Multi-code CDMA is like regular CDMA, except that a single mobile can send multiple data streams at the same time using several channels, i.e., using a different diffusion code for each data stream. This allows the mobile unit to increase its data rate to a multiple of the single channel data rate.

Overview of the present claims

The present claims are directed to ways of managing the channels used by mobiles in a multi-code CDMA system, in which a mobile station communicates with one or more base stations using a plurality of CDMA channels.

Claims 2 and 8 address the situation where a mobile station is communicating with a base station using several channels, and the base station becomes saturated (*i.e.*, all of its channels are in use). In that case, the mobile station stops communicating on one or more of the CDMA channels of the base station, and begins communicating on one or more of the channels of a different base station, while still communicating on at least one channel of the saturated base station. In other words, some, but not all, of the mobile's data streams are handed over from the saturated base station to a different base station.

Claims 4 and 10 address the situation where a base station receives a request from a mobile to use two or more channels. If the base station has the requested number of channels available, it communicates with the mobile using the requested number of channels. If the base station does not have the requested number of channels available, the base station communicates with the mobile using less than the requested number of channels, and a host arranges for other base stations to provide the remaining number of needed channels. Thus the mobile station requests channels from one base station but is ultimately put in communications with channels on two or more base stations.

Claims 5 and 11 address the situation where a base station receives a request from a mobile for one or more channels and does not have enough channels available to satisfy the request. In this case, the base station stops communication with another mobile on some

channels while remaining in communication with the mobile on at least one channel, and the host arranges for other base stations to provide the an equal number of channels to the mobile. Thus a saturated base station can free up channels by handing over some but not all of the data streams from the mobile to other base station.

Benveniste

Benveniste has been discussed before in response to previous rejections. Benveniste describes a resource allocation method in a conventional CDMA system. In this system, calls can be handed over from one base station to another. When a hand-over occurs, all communication with the mobile is transferred to a different base station. Thus Benveniste does not involve multi-code CDMA, and does not address any situation other than the handover of all communication from one base station to another.

Gitlin

Gitlin involves a multi-code CDMA system. In particular, Gitlin addresses the issue of providing a variable data rate that is selectable by the mobile. To accomplish this, Gitlin discloses a mobile device that can send data over a selectable number of channels at the same time. For example, Figure 2 shows a mobile unit that has three coder units that apply three different diffusion codes to three different data streams. Those streams are then summed and transmitted at the same time (see col. 3, lines 7-51). Figure 3 shows another embodiment in which a single coder unit is operated at a selectable rate that is sufficient to generate diffusion code bits for application to a selected number of data streams (in this case, three), which are then summed and transmitted at the same time (see col. 3, lines 52-64). Figure 4 shows a third embodiment in which a single coder unit also provides diffusion code bits for multiple data streams that are transmitted simultaneously (see col. 3, line 65 – col. 4, line 17).

Gitlin describes two control methods for assigning channels to a given mobile: a demand approach, and a probabilistic approach. In the demand approach, the mobile tells the base station how many channels it wants to use. The base station replies by telling the mobile how many channels it may use, which may be the same number requested, or fewer than the number requested (see col. 5, lines 1-40; col. 6, lines 20-35; col. 7, lines 9-20; Fig. 5, ref. no. 509-513). In the probabilistic approach, the base station broadcasts its current channel load, and the mobile decides the number of channels to use (see col. 5, lines 41 – col. 6, line 2; col. 6, lines 48-66; col. 7, lines 21-32; Fig. 5, ref. no. 523-527).

Gitlin does not describe any mode of operation in which a mobile practices multi-code CDMA by transmitting channels to two different base stations at the same time.

Differences between the cited art and the claims

Regarding claims 2 and 8, neither of the references teaches that when a base station is saturated, some channels of a mobile station are terminated while others remain in use, and the terminated channels are then handled by other base stations. Benveniste teaches that all communication of a mobile is transferred from one base station to another. Gitlin teaches that a mobile communicates with a base station over multiple channels, but does not teach a mobile communicating over the channels of two different base stations at the same time, or any circumstances or control methods that would produce that result. The difference between the combined teaching of the references is such that claims 2 and 8 would not be obvious in light of their teachings.

Regarding claims 4 and 10, neither of the references teaches that a base station receives a request from a mobile to use two or more channels, and if the base station has the requested number of channels available, it communicates with the mobile using the requested number of channels, but if the base station does not have the requested number of channels available, the base station communicates with the mobile using less than the requested number of channels, and a host arranges for other base stations to provide the remaining number of needed channels. Benveniste teaches that all communication of a mobile is transferred from one base station to another. Gitlin teaches that if the base station does not have the requested number of channels, it communicates using less than the requested number, but it does not teach any control method for arranging for another base station to provide the additional requested channels. The difference between the combined teaching of the references is such that claims 4 and 10 would not be obvious in light of their teachings.

Regarding claims 5 and 11, neither reference teaches that a base station receives a request from a mobile for one or more channels and does not have enough channels available to satisfy the request, and so the base station stops communication with another mobile on some channels while remaining in communication with the mobile on at least one channel, and the host arranges for other base stations to provide the an equal number of channels to the mobile. Benveniste teaches that all communication of a mobile is transferred from one base station to another. Gitlin teaches that if the base station does not have the requested number

of channels, it communicates using less than the requested number, but it does not teach any control method for arranging for moving some of the channels of another mobile to another base station, and using the freed-up channels to communicate with the requesting mobile. The difference between the combined teaching of the references is such that claims 5 and 11 would not be obvious in light of their teachings. In addition, claim 11 depends from claim 10, and is further distinguished for the reasons described for claim 10.

Claims 6 and 12 depend from the previously addressed claims and are distinguished for the reasons described for those claims.

Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 12 February 2007

By 

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